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XX. *Two Letters from the Hon. William Hamilton, His Majesty's Envoy Extraordinary at Naples, to the Earl of Morton, President of the Royal Society, containing an Account of the last Eruption of Mount Vesuvius.*

Naples, June 10, 1766.

My Lord,

Read March 5,
and April 2,
1767.

AS I have attended particularly to the various changes of Mount Vesuvius, from the 17th of November 1764, the day of my arrival at this capital, I flatter myself, that my observations will not be unacceptable to your lordship, especially as this Volcano has lately made a very considerable eruption. I shall confine myself merely to the many extraordinary appearances that have come under my own inspection, and leave their explanation to the more learned in natural philosophy.

During the first twelvemonth of my being here, I did not perceive any remarkable alteration in the mountain; but I observed the smoke from the mouth of the Volcano was much more considerable in bad weather than when it was fair; and I often heard (even at Naples, six miles from Vesuvius) in bad weather, the report of the inward explosions of the mountain. When I have been at the top of Mount Vesuvius in fair weather, I have sometimes found so
little

little smoke that I have been able to see far down the mouth of the volcano, the sides of which were incrustated with salts and minerals of various colors, white, green, deep and pale yellow. The smoke that issued from the mouth of the volcano in bad weather was white, very moist, and not near so offensive as the sulphureous steams from various cracks on the sides of the mountain.

Towards the month of september last, I perceived the smoke to be more considerable, and to continue even in fair weather ; and in october I perceived sometimes a puff of black smoke shoot up a considerable height in the midst of the white, which symptom of an approaching eruption grew more frequent daily ; and soon after, these puffs of smoke appeared in the night tinged like clouds with the setting sun.

About the beginning of November, I went up the mountain ; it was then covered with snow, and I perceived a little hillock of sulphur had been thrown up since my last visit there, within about forty yards of the mouth of the volcano ; it was near six feet high, and a light blue flame issued constantly from its top. As I was examining this phenomenon, I heard a violent report, and saw a column of black smoke followed by a reddish flame, shoot up with violence from the mouth of the volcano, and presently fell a shower of stones, one of which falling near me, made me retire with some precipitation, and also rendered me more cautious of approaching too near, in my subsequent journeys to Vesuvius.

From november to the 28th of march, the date of the beginning of this eruption, the smoke encreased and was mixed with ashes, which fell, and did great

damage to the vineyards in the neighbourhood of the mountain. A few days before the eruption I saw (what Pliny the younger mentions having seen, before that eruption of Vesuvius which proved fatal to his uncle) the black smoke take the form of a pine-tree. The smoke that appeared black in the day-time for near two months, before the eruption had the appearance of flame in the night.

On good friday, the 28th of march, at 7 o'clock at night, the lava began to boil over the mouth of the volcano, at first in one stream; and soon after, dividing itself into two, it took its course towards Portici. It was preceded by a violent explosion, which caused a partial earthquake in the neighbourhood of the mountain, and a shower of red hot stones and cinders were thrown up to a considerable height. Immediately upon sight of the lava, I left Naples with a party of my countrymen, whom I found as impatient as myself to satisfy their curiosity in examining so curious an operation of nature. I passed the whole night upon the mountain; and observed that, though the red hot stones were thrown up in much greater number and to a more considerable height than before the appearance of the lava, yet the report was much less considerable than some days before the eruption. The lava ran near a mile in an hour's time, when the two branches joined in a hollow on the side of the mountain, without proceeding farther. I approached the mouth of the volcano, as near as I could with prudence; the lava had the appearance of a river of red hot and liquid metal, such as we see in the glass houses, on which were large floating cinders half lighted, and rolling one over another
with

with great precipitation down the side of the mountain, forming a most beautiful and uncommon cascade; the color of the fire was much paler and more bright the first night than the subsequent nights, when it became of a deep red, probably owing to its having been more impregnated with sulphur at first than afterwards. In the day-time, unless you are quite close, the lava has no appearance of fire; but a thick white smoke marks its course.

The 29th the mountain was very quiet, and the lava did not continue. The 30th it began to flow again in the same direction, whilst the mouth of the volcano threw up every minute a girandole of red hot stones, to an immense height. The 31st I passed the night upon the mountain; the lava was not so considerable as the first night, but the red hot stones were perfectly transparent, some of which I dare say of a ton weight, mounted at least 200 feet perpendicular, and fell in, or near, the mouth of a little mountain, that was now formed by the quantity of ashes and stones, within the great mouth of the volcano, and which made the approach much safer than it had been some days before, when the mouth was near half a mile in circumference, and the stones took every direction. Mr. Hervey, brother to the earl of Bristol, was very much wounded in the arm some days before the eruption, having approached too near; and two English gentlemen with him were also hurt. It is impossible to describe the beautiful appearance of these girandoles of red hot stones, far surpassing the most astonishing artificial firework.

From the 31st of march to the 9th of april, the lava continued on the same side of the mountain in

two, three, and sometimes four branches, without descending much lower than the first night. I remarked a kind of intermission in the fever of the mountain, which seemed to return with violence every other night. On the 10th of april at night the lava disappeared on the side of the mountain towards Naples, and broke out with much more violence on the side next the *Torre dell' Annunciata*.

I passed the whole day and the night of the 12th upon the mountain, and followed the course of the lava to its very source; it burst out of the side of the mountain, within about half a mile of the mouth of the volcano, like a torrent, attended with violent explosions, which threw up inflamed matter to a considerable height, the adjacent ground quivering like the timbers of a water-mill; the heat of the lava was so great as not to suffer me to approach nearer than within ten feet of the stream, and of such a consistency (though it appeared liquid as water) as almost to resist the impression of a long stick, with which I made the experiment; and large stones thrown on it with all my force did not sink, but, making a slight impression, floated on the surface, and were carried out of sight in a short time; for, notwithstanding the consistency of the lava, it ran with amazing velocity; I am sure, the first mile with a rapidity equal to that of the river Severn, at the passage near Bristol. The stream at its source was about ten feet wide, but soon extended itself, and divided into three branches, so that these rivers of fire communicating their heat to the cinders of former lavas, between one branch and the other, had the appearance at night of a continued sheet of fire, four miles in length, and in some parts near

two in breadth. Your lordship may imagine the glorious appearance of this uncommon scene, such as passes all description.

The lava, after having run pure for about 100 yards, began to collect cinders, stones, &c. and a scum was formed on its surface, which in the day-time had the appearance of the river Thames, as I have seen it after a hard frost and great fall of snow, when beginning to thaw, carrying down vast masses of snow and ice. In two places the liquid lava totally disappeared, and ran in a subterraneous passage for some paces, then came out again pure, having left the scum behind. In this manner it advanced to the cultivated parts of the mountain; and I saw it the same night of the 12th, unmercifully destroy a poor man's vineyard and surround his cottage, notwithstanding the opposition of many images of St. Januarius, that were placed upon the cottage, and tied to almost every vine. The lava, at the farthest extremity from its source, did not appear liquid, but like a heap of red hot coals forming a wall, in some places ten or twelve feet high, which rolling from the top soon formed another wall, and so on, advancing slowly not more than about thirty feet in an hour.

The mouth of the volcano has not thrown up any large stones since the second eruption of lava, on the 10th of april, but has thrown up quantities of small ashes and pumice stones, that have greatly damaged the neighbouring vineyards. I have been several times at the mountain since the 12th; but as the eruption was in its greatest vigour at that time, I have ventured to dwell on, and I fear tire your lordship with, the observations of that day.

In my last visit to Mount Vesuvius the 3d of June, I still found that the lava continued, but the rivers were become rivulets and had lost much of their rapidity. The quantity of matter thrown out by this eruption, is greater than that of the last in the year 1760, but the damage to the cultivated lands is not so considerable, owing to its having spread itself much more, and its source being at least three miles higher up. This eruption seems now to have exhausted itself; and I expect in a few days to see Vesuvius restored to its former tranquillity.

Mount Etna in Sicily broke out the 27th of april, and made a lava in two branches, at least six miles in length, and a mile in breadth, and, according to the description given me by Mr. Wilbraham, who was there, after having seen with me part of the eruption of mount Vesuvius, resembles it in every respect, except that mount Etna, at the place from whence the lava flowed (which was twelve miles from the mouth of the vulcano), threw up a fountain of liquid inflamed matter to a considerable height; which, I am told, mount Vesuvius has done in former eruptions.

I beg pardon for having taken up so much of your time, and yet I flatter myself, that my description, which I assure your lordship is not exaggerated, will have afforded you some amusement. I have the honour to be,

My Lord,

Your Lordship's most obedient
and most humble servant,

William Hamilton.

SINCE

Naples, February 3, 1767.

Read April 2, 1767. **S**INCE the account of the eruption

of mount Vesuvius, which I had the honour of giving to your lordship, in my letter of the 10th of june last, I have only to add, that the lava continued till about the end of november, without doing any great damage; having taken its course over antient lavas. Since the cessation of this eruption, I have examined the crater, and the crack on the side of the mountain towards *Torre dell' Anonciata*; about a hundred yards from the crater from whence this lava issued: and I found therein some very curious salts, and sulphurs; a specimen of each sort I have put into bottles myself, even upon the mountain, that they might not lose any of their force, and have sent them in a box directed to your lordship, as you will see by the inclosed bill of lading. I am sure you will have a pleasure in seeing them analyzed. I have also packed in the same box some lava, and cinders, of this eruption; there is one piece in particular very curious, having the exact appearance of a cable petrified. I shall be very happy if these trifles should afford your lordship a moment's amusement.

It is very extraordinary, that I cannot find, that any chemist here has ever been at the trouble of analyzing the productions of Vesuvius.

The deep yellow, or orange-color salts, of which there are two bottles, I fetched out of the very crater of the mountain, in a crevice that was indeed very hot. It seems to me to be powerful, as it turns silver
5. black.

black in an instant, but has no effect upon gold. If your lordship pleases, I will send you by another opportunity specimens of the sulphurs and salts of the *Solfa terra*, which seem to be very different from these.

Within these three days, the fire has appeared again on the top of Vesuvius, and earthquakes have been felt in the neighbourhood of the mountain. I was there on saturday with my nephew lord Greville; we heard most dreadful inward grumbings, rattling of stones, and hissing; and were obliged to leave the crater very soon, on account of the emission of stones. The black smoke arose as before the last eruption; and I saw every symptom of a new eruption, of which I shall not fail to give your lordship an exact account.